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SELECTED TRANSLATIONS ON USSR COMMUNICATIONS (7)

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## SELECTED TRANSLATIONS ON USSR COMMUNICATIONS (7)

This is a series publication containing translations of items concerning communications in the USSR. The items contained herein, covering the subjects listed in the table of contents below were taken from various newspapers, periodicals, etc., published in the USSR from 1 January - March 1961.

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## SELECTED TRANSLATIONS ON USSR COMMUNICATIONS (7)

INTRODUCTION OF NEW MEANS OF COMMUNICATION AND EQUIPMENT -- Moscow,  
Elektricheskiye Stantsii, No 2, 1961

During recent years our industry produced numerous models of new communication equipment which can be successfully utilized in conjunction with the operation of power systems, thus replacing such means of communication as wire lines.

However, new means of communication, especially radio-communication installations and the small-sized cables covered with masticated rubber, are utilized in conjunction with the operation of the power systems in insufficient quantities.

This article deals with the means of communication of the power systems and the possibilities of utilizing newly developed equipment.

### Overhead Lines of Communication

We know from experience that operating expenses for the maintenance and repair of wire lines of communication are extremely high. The construction of reinforced concrete posts or supports for the lines of communication is extremely difficult. Furthermore, the installation of a line of communication with reinforced concrete poles increases the cost by almost 40%.

The rate of breakdowns of overhead lines is extremely high. These peculiarities of overhead lines of communication render their utilization in the power systems quite unfeasible with the exception of the local, short lines.

In rare cases, when the overhead mains of a power system must still be used, the cross arm design of the poles should be followed in order to ensure utilization of the poles for other services.

The installation of telephone wires on existing communication lines usually entails considerable alterations to the line structures.

Apart from the high costs, the installation of additional circuits on the existing lines involves difficulties in connection with the operation of the active lines which must ensure the continued and uninterrupted work of the channels of communication and signals.

Consequently, it is practicable to install telephone wires on the existing overhead lines of communication only in cases when the volume of modification work of the existing structures is insignificant (without the replacement of the poles, or installation of supports, and without modification of the basic profile of the line of communication).

### Cable Lines of Communication

Cable lines of communication are utilized in the power systems mainly for the purpose of connecting the junction sub-stations with control points and are usually installed in urban areas.

In view of the great demand for channels for local and long-distance communication in these areas, the capacity of these trunk cables is very substantial.

Type KRR 30/60 equipment is being manufactured at the present time. The use of this equipment will permit reduction of the capacity of trunk cables and elimination of installation of parallel trunk lines.

Within the frequency range of 12-552 kilocycles, equipment KRR provides for obtaining 30 telephone communication channels along one wire of the trunk cable and up to 60 telephone channels with two wires. The equipment is provided with a tonal impulse call device and can, therefore, be used for connecting lines between the ATS (Avtomaticheskiye telefonnyye stantsii -- Automatic dial stations). It would appear that the intermediate products of this equipment would afford the accomplishment of an automatic connection of the long-distance cable trunks. This is very important for the power systems as it permits drastic reduction of the personnel at junction sub-stations and, in certain cases, liquidation of inter-city hand-operated switchboards.

By now the KRR equipment has been tried successfully in a number of towns and arrangements are being made for mass output in 1960.

Production of the new type K-1 and K-2 equipment has commenced. This comprises two-wire cables sealed with the polyvinyl chloride insulation which permits accomplishment of up to three transmissions through a PRVFM cable within the 8.3-26.3 kc band and in the range of up to 50 km, with two intermediate amplifiers (repeaters). With the four-wire transit interchange the range of operation of the equipment may be increased to 100 km.

With the cables provided with a higher quality insulation of the contacts, the range of operation of the communication network system may be increased very substantially. With the utilization of the PRPM cables with the polyethylene insulation, the range of operation of the communication network equipped with the apparatuses K-1 and K-2, is doubled.

The cost of installation of communication channels utilizing cables consisting of only a few wires covered with masticated rubber, in the ordinary ground (of the first or second category) will be much lower than the cost of the construction of overhead lines (about 400 roubles per one kilometer). Mechanical means of installation of the lines can be used extensively. The practicability of utilizing cables with polyethylene insulation in regions of hard and rocky ground must be confirmed by appropriate calculations.

There is a shortage of the FKB-1x1.3 cable used for connecting the high-frequency stations with the equipment installed in the territory of the open switchboard distributors. Replacement of the FKB cables with the RK cables covered with masticated rubber is most practicable. In order to increase the mechanical durability the cable at the floor of the trench can be covered with the 20x20 mm gauge angle iron or with reinforced concrete plates. This method would release the industry from the production of the

EKB cable which has no application in any other branches of communication service.

### High-Frequency Communication by Means of Overhead Power Transmission Lines

High-frequency communication channels using VL (overhead) wires must constitute the basic means of communication in the power networks. Maximum utilization of high-voltage lines for the purpose of installation of the telephone and telautomatic conduits is advisable.

The incorrect tendency to curtail the utilization of VL lines for communication purposes still exists. This curtailment concerns, most of all, the power transmission lines feeding the traction sub-stations of the railroads.

However, there actually is no objection against utilizing the power transmission lines feeding the electric traction for the installation of the intra-network communications and telautomatics conduits. In most cases, existence of the short dead-end branches will not interfere with the work of the channels, when the carrying frequencies are properly selected in the higher portion of the assigned range.

Utilization of the high frequencies becomes possible when the equipment is hooked up with both circuits of the high-voltage line, which eliminates high-frequency by-passes at the transit sub-stations, thus decreasing the attenuation of the channels. The high-frequency line traps which are specified in the planning and included in the dead-end branches of the overhead lines, do not have to be installed in most instances. However, absence in the planning of the frequency specification of a sub-station does not solve the problem of the necessity of installation of line traps predicated on the length of the branch. The same reason prevents accurate selection of the carrier frequency in the high-frequency channels.

Industrial production of intermediate high-frequency communication amplifiers greatly increases the range of the channel operations. As an example of existing long-distance channels one might mention the communication and telautomatics metallic channels of the 400-KW Volga GES- Moscow power transmission line which has been in operation for several years.

On the other hand, however, the high-voltage 110-KW, 1500-km long power main has no high-frequency communication channels. An independent communication line has been installed alongside the power main and the cost of its maintenance is extremely high. A similar situation exists also in other power networks.

During the current year the VNIIE (All-Union Scientific Research Institute of Electric-Power Engineering) has developed -- in conjunction with a certain plant -- new high-frequency stations for line communications which can be transported by motor vehicle and carried by hand.

Utilization of these stations broadens substantially the area of application of the high-frequency communication along the high-voltage wires. It becomes possible to utilize this type of communication for the line operating service. Special call stations accessible to motor transport should be installed at points along the power transmission line. At these points the

apparatus should be connected with the wiring of the overhead lines through the sections of the lightning protective cable 0.4 km to 1 km long.

In certain cases the high-frequency stations can be connected with the power-transmission line through the antenna wire which can be seen near the high-voltage line hanging above the ground at a safe distance from the wires of the overhead line.

On the long-distance power transmission lines which have special maintenance and repair bases between the sub-stations it is practicable to use the high-frequency channels to communicate with these bases. In such cases, the high-frequency stations installed at the repair bases are hooked up with the wiring of the line through communication capacitors or sections of the lightning protective cables. The experience of application of the above-mentioned system on the 500-KW overhead Stalingrad GES- Moscow channel proves that utilization of the high-frequency communication for repair bases located between sub-stations is perfectly feasible.

As proposed by Teploelektroproyekt, the high-frequency service was designed for the 220-KW power transmission line instead of an electric communication line. The HF stations at the repair base are hooked up with the line wiring through the insulated section of the cable approximately 2 km long.

For the purpose of obtaining a stabilized channel and reducing the crosstalk attenuation it is practicable to hook up the moveable HF stations -- as well as the HF stations set up at the repair bases -- through the coupling capacitors of 200-500 micromicrofarad.

The question of power supply of the HF stations installed at the repair bases is very important. Absence of a definite source of industrial-frequency power supply necessitates installation of the HF stations on semiconductors, with the power supplied by a low-voltage (12-24) source of direct current. In this case power supply can be obtained from the portable batteries of the type used in motor vehicles.

Mobile repair base HF stations developed by the All-Union Scientific Research Institute of Electric Power Engineering, in conjunction with a certain plant, have been successfully tested on the power transmission lines.

### Radio Communication

Present-day radio communications within power systems is not utilized to the fullest. Meanwhile, new radio stations developed by the industry open wide possibilities for introducing this progressive means of communication.

Model RRS-1 radio stations utilized in many USW-power systems proved to be efficient. However, further broadening of the use of the equipment of this type is prevented by the limited frequency range of the sound spectrum of television and FM broadcasting.

This year the industry is organizing the production of the small-channel USW radio stations in the higher frequency range which should be used as a basis.

The industry is commencing mass production of radio relay systems of average capacity of 24 telephone channels. This equipment should be

utilized in the power systems instead of the cable lines, within urban areas and also on the overloaded mains.

It should be taken into account that the distance between the proximate amplifying points of this installation does not exceed 50 km (normally 30-40 km), while voltage of the power supply of the equipment and lighting of the masts is approximately 10 kilovolt-ampere.

Microwave equipment with tropospheric propagation on 12 to 24 telephone channels is highly practicable in the power systems. This type of communication, covering without intermediate stations - distances of up to 400 km, is most acceptable for extensive intersystem channels because it eliminates the necessity of establishing intermediate amplifying points, which substantially simplifies the problem of power supply for the equipment.

Radio relay systems with delta modulation deserve attention. This equipment, with a capacity for 6 to 12 telephone channels, will be soon tested for use in the power system.

The introduction of radio stations TsRS and ARS into the operations of the USW power systems has commenced relatively recently. The use of these radio stations for the line operated communication is specified for the 500-KW overhead lines.

One other type of radio station which may be utilized in the power systems should be mentioned.

The 1500-kc frequency band of these radio stations prevents their utilization due to a high rate of interference prevalent near the high-voltage wires of the overhead lines. However, they can be successfully used for communication by construction organizations within 50-km limits. The stations are very small in size and light in weight (about 3 kg), which makes them portable.

A mobile radio communication installation consisting of four radio stations has been developed and is being prepared for production. This equipment has various operations which differ in frequency range, call system, power supply, etc.

Permanent radio stations of the RTS type of this series can be operated by remote control from a distant point located up to 10 km away from the station. This permits installation of radio at the most advantageous positions, depending on the distance, while the control desk may be located in the office of the radio dispatcher or another person using the radio communication.

This system of radio stations facilitates the organization of operational networks for line servicing of power transmission lines. There are radio stations which can be used in atomic electric-power plants in buildings with a high degree of radioactivity.

#### Power Supply

A serious problem is created by the rejection of storage batteries as a means of power supply for communications equipment.

Most of the communications equipment produced is supplied by the alternating current network. However, there still is a number of instal-

lations which are not built for this method of power supply but require a direct-current supply. The latter include the ATS, dispatch switchboards, the apparatus B-12 and K-24, and emergency signal equipment.

Transferring the power supply of dispatch switchboards DKZ-40 and DKZ-70 and of the emergency signal equipment to rectifiers BP-9 or VT-61/2-4 is quite possible.

Two sets of BP-24 connected in sequence, or rectifiers VT-61/2-4 with the autotransformer (balancing coil) switched on after the voltage stabilizer, can be utilized for the DKZ switchboards. In principle, it is also possible to supply power to the ATC from the rectifier devices at the electric stations. In this case, however, it is not always possible for the ATS to withstand the permissible voltage oscillation of the supply line, as set up by the plants manufacturing ATS. However, distribution networks within a power station are of comparatively short length, which simplifies considerably the operation of the ATS.

The storage of power becomes exceptionally important in transferring the power supply of equipment from the alternating current network.

One of the more practicable methods of storing power is voltage conservation from the power lines through a coupling capacitor. The coupling capacitor is connected directly to the wires of the power transmission line by-passing the switchboard of the substation, with the result that the power-supply voltage will not be predicated on the efficiency of the switchboard and power equipment of the substation.

In order to store power in the event of an emergency or a breakdown along the power-transmission lines leading to certain important installations, it is possible to utilize semiconductor converters for transforming the low-voltage direct current into alternating 220v current.

#### Protection of Communication Lines from the Influence of Power-Transmission Lines

At present, the protection of communication lines from the influence of overhead lines is conducted on the basis of antiquated regulations agreed upon by the departments concerned in 1932 and 1943. Many articles of these regulations should be revised.

Of the articles requiring revision the most important is that dealing with the standards for interfering influences and, in particular, telephone channels of voice frequency and the one-wire telegraph channels.

At the time when the current-protection regulations were being promulgated, telephone and telegraph circuits were the basic channels of communication. The high-frequency equipment for multiplexing wire circuits, as well as voice-frequency telegraph equipment, were then in the initial stages of development. The length of power-transmission lines was also insignificant and the maximum voltage of overhead lines was 154 KW. Under such circumstances the accepted standards for influences interfering with telephone and telegraph circuits -- 5 millivolts and 1 milliamperes -- were apparently adequate, and maintaining such standards presented no difficulty. Conditions have changed since then. Now the basic telephone mains comprise channels obtained by means of high-frequency multiplexing of cir-

cuits, whereas voice-frequency and supersonic channels are used for telegraph. In addition, the length of power-transmission lines has extended considerably, while their voltage has increased to as much as 500 KW.

At the present time voice-frequency channels are utilized basically for communication service within relatively short distances and the standards for interfering influences for these channels, as well as those for telegraph channels, must be revised in the upward direction.

This will reduce the costs of constructing overhead lines, as it will permit bringing the line route closer to the highways and railroads and will curtail drastically unnecessary transportation expenses.

Another question requiring revision deals with the necessity of installing conduits on the communication lines at their intersection with the power-transmission lines of 400-500 KW, and with the requirement regarding the length of the conduit sections of the communications lines towards the reduction of the distances between the conduit supports and the last wire of the overhead line.

For the correct evaluation of the magnitude of the influence of the overhead lines on the communication lines, it is necessary to compile a map of specific conductivity of the earth in the Asiatic portion of the USSR, where construction of a large number of power-transmission lines is now underway. It is necessary to develop correct methods of measuring the specific conductivity of the earth, since the methods for this determination presently recommended by the TsNIIS of the Ministry of Communications are difficult to implement and produce inaccurate results.

CERTAIN TECHNICAL PRINCIPLES OF PLANNING A TELEVISION NETWORK -- Moscow, Tekhnika Kino i Televideniya, No 3, 1961, pages 1-3

The great successes in the development of the television network in our country, which were accomplished during recent years, can be attributed to the following factors: scientifically based planning of the television network, design and construction of the models of television units, and the introduction into our industry of a wide variety of television equipment and installations. The speedy development of the television network is ably assisted by local party and Soviet organizations.

A considerable role in planning the development of the telecasting network is played by the correct distribution of frequencies among the television centers and relay stations.

As is well known, the following frequency bands are utilized for telecasting: 48.5-56.0 mc (two channels -- 1st and 2nd); 76-100 mc (six channels-- 6th, 7th, 8th, 10th, 11th, and 12th).

The planning of the television transmitting network is conducted with a consideration of the territorial combination of the television transmitting and USW-FM broadcasting transmitters, for the purpose of conserving the funds for capital construction and further operations, as well as creation of equal conditions for television reception and also of USW-FM radio-broadcasting programs.

Ultra-shortwave radio stations of the majority of the operating television centers and the RTS (Tractor Repair Stations) operate in the range of 48-100 mc with the capacity of transmitters at 15/7.5, 5/2.5 & 2/1 KW (numerator represents capacity of the picture transmitter; denominator represents power of the sound transmitter).

Plans for the future provide for extensive utilization of the 5/1.5 KW television stations on the frequencies of all 12 channels and also for utilization in a number of points of high-powered (to 50 KW) transmitters with the antennae installed at a height of 350-500 meters. This would permit reduction of the number of television stations required to cover a large territory. Thus, television networks will be using in future the 5/15, 25/7.5 and 5/1.5 KW transmitters operating on radiating-cooled tubes.

In the distribution of television channels the 500-microvolt field strength is accepted for the 48-100 mc range and 700-microvolt field strength for the 174-230 mc range. The protective ratio of the signals for the stations operating in a channel with the same frequencies is 45 db (decibel). In order to lower the level of mutual interferences among television stations operating on the same frequency channel, replacement of their carrier frequencies is provided for, thus ensuring reduction of mutual interferences by 12 db.

For the purpose of working in conditions when carrier frequencies are being replaced, new resonant-line oscillators have been developed to ensure that the stability of the carrier frequency is in the order of  $3 \cdot 10^{-6}$ .

In 1957-58 a plant of the State Committee on Radioelectronics developed new equipment for the studio-camera installation (complex) which provides for utilization of from 2-18 cameras, film editing, and the showing of full-length movies in 35 mm as well as 16 mm sizes, and also for sending signals to the television radio station and the inter-city (radio relay or cable) communication line. The complex of this installation includes a monoscopic device for formulation of a complete standard television signal per test chart 0249.

Unfortunately, neither the plants of the State Committee on Radioelectronics, nor those of the Leningrad Sovnarkhoz have organized the production of this equipment and only a few experimental models have been manufactured.

Of considerable interest is the newly developed one-channel mobile reporter set of the ARTU type, equipment that can be fitted into a passenger car.

A pack-set television outfit of the RTU type will be found useful in conducting on-the-spot reporting. As with the ARTU, this set is intended for operation in conjunction with the PTS and may be located as far as 500 m away from the latter. It should be noted that until now the production of this equipment has not been organized.

Further improvement in the quality of telecasting will depend upon the uninterrupted development and perfection of technical means and an increase in the reliability and stability of the television centers and the television relay stations. In this connection it is intended to equip television stations with the new industrial television equipment in accordance with the modern requirements.

The entire 1960 production of television equipment for the transmission of movie films utilizes the vidicon-type tube. Production of the telecinematographic (film television) equipment using photoconductive camera tubes will commence in 1962 to replace the old telecinematographic equipment being operated at the television centers.

Providing television centers with the new telecinematographic equipment will permit a substantial improvement in the quality of film transmission, while the released camera channels on the LI-7 tubes will be utilized in the studios.

In order to improve the quality of the television picture, the new, better transmission tubes will be used at the television centers. The LI-101 tube which will replace the widely used tube LI-7 requires considerably less illuminance (approximately  $1/3$  to  $1/2$  that of LI-7) of the object being transmitted, while the quality of the image is considerably higher than that obtained with tube LI-7.

In order to improve the quality of transmission within studios, type LI-201 tube (super-orthicon) will be widely used. Due to a number of improvements this tube produces a high-quality image in a low illuminance of the object being transmitted.

The plants of the State Committee on Radioelectronics and those of the Leningrad Sovnarkhoz are delaying the serial production of the new tubes and sound heads required for actuation of the existing equipment at the television centers.

The PTS cameras will be equipped with a large assortment of lenses with various focal distances including an adjustable distance, which will provide the producers and cameramen with considerably broader possibilities.

The video-channel equipment will include devices for regulation of the form of amplitude characteristics (gamma-correction), and also devices for aperture and noise correction, which will noticeably improve the quality of the image.

In view of the extensive construction schedules of the new television centers it is necessary to achieve reduction in operating costs and also to find means for automatization of the transmitting processes.

During the implementation of the Seven-Year Plan television centers will be constructed at points away from the radio relay and cable line runs. These centers will have a limited opportunity of creating their own programs and will extensively use taped programs.

Utilization of video tape recorders and electronic program devices permits automatization of process of telecasting. The most important part of automatization of the technical means of telecasting will be played by the use of automatized television transmission stations controlled by signals received via radio relay or cable lines of communication or from the instrument desk of the television centers, and via the automatized lowpower relay stations.

The television receiving network is developing simultaneously with the TV transmitting network.

The most popular models of television receivers are at present the sets with screen sizes (oblique) of 35 and 43 cm. On the other hand, small quantities of television sets with a 53-cm screen are also produced. In

addition, there are combination devices which include, television set, radio receiver, record player, and tape recorder.

All television sets are designed to receive TV transmission on any of the 12 channels available in the USSR, while some sets can, in addition receive USW-FM radio-broadcasting stations.

The television sets produced at present include: rectangular kine-scope, unified current nodes and parts, small-button glass tubes, semi-conductor diodes, and other modern devices. Automatic regulation of various parameters will be widely introduced in the proposed new television receivers; unification of separate nodes and sound heads, etc., will be carried out, which will improve working characteristics of the television sets and simplify their operation.

Particular attention will be devoted to the question of increasing the operational reliability and repairability of the TV sets and to that of easier selection of channels, the stability of operation, and elimination of interference.

The maintenance service for the receiving network in the entire territory covered by telecasting is conducted by a system of special TV studios and their branches -- which will be developed extensively during the Seven-Year Plan -- as well as by other radio repair shops operated by the Ministries of Communication of the Union Republics.

The method of repairing TV sets at the places where they are operated is most convenient for the population and will be further developed and perfected. Maintenance and repair enterprises will be equipped with compact portable instruments which will be widely utilized in servicing TV sets in the homes of the users.

Common antennas for collective television reception will receive wide application, thus ensuring high-quality reception of programs.

The following consumers' devices developed by the NII of the Ministry of Communications USSR, will permit installation of collective-reception antennas at any inhabited point within the area of telecasting: "Directional coupler," 12-channel antenna amplifier (booster), and broad-band multi-channel antenna. On the other hand, various types of individual antennas will continue to play an important role and their production as well as the production of other auxiliary devices (voltage stabilizers, interference inhibitors) must be organized by the industry.

A. Badalov,  
Chief, Main Radio Administration,  
Ministry of Communications USSR

TELEVISION IN AZERBAIDZHAN, Moscow, Radio No 3, 1961, page 10.

"The development of television in Azerbaydzhan," he says, began in 1956, when the Baku Television Center -- one of the largest in the Soviet Union -- joined the ranks." At the beginning, its transmissions were received within a 70-80 km radius, while present telecasting covers a large portion of the territory inhabited by 70% of the total population of the

Republic. It is expected that by 1965 the entire population will be viewing at least one program, while Baku will have two television programs with a possible changeover to color television.

At present there are low-capacity television relay stations built in many areas of the republic: Kuba, Divichi, Lenkoran', Neftechal, Sal'yany, Pushkino, Ali-Bayramly. The Kirovabad television relay station also commenced operations and its signals are being received by TV sets "Rekord" and "Rubin" equipped with ordinary outdoor one-story-high antennas as far away as Mingeaur and Yevlakh.

"Transmissions of the Baku Television Center," continued Gezalov, "are received far beyond the borders of Azerbaydzhan. For example, even at the beginning its signals were received at Krasnovodsk, 300 km from Baku. Later, a television station was constructed in Baku and has been in operation for several years. However, service was unstable once for three days during the winter of 1958. Otherwise, reception of the Baku TV Center was good."

It has been proved by experience that TV transmissions from Baku may be successfully received even in Gur'yev. Thus, it appears that the actual range of the Baku TV Center turned out to be considerably greater than the "theoretical" zone of positive reception.

The start of operation of the Baku-Kirovabad radio relay line, in August last year, was a big event in the life of not only Azerbaydzhan, but of all the Transcaucasus Republics. Transmissions from Baku can now be viewed not only by the residents of Kirovabad but also by those of nearby Khaylarskiy, Kasum-Izmailovskiy, and other rayons. The line will be extended to Tbilisi with a branch to Yerevan, thus making it possible to exchange programs with these cities.

In order for the telecasting to cover the largest possible area, the installation is contemplated of television relay stations along the run of the radio relay lines. One of the transmitters is being constructed in Geokchay. This will provide television broadcasting to a territory 70-80 km in radius.

Within the next 2-3 years the existing relay station in Kirovabad will be replaced with a TV-program center which will be able also to relay the transmission of the Baku and Tbilisi TV centers. Construction of a TV center in Nakhichevan' has also commenced. Plans are underway at present for the construction of the Yevlakh-Stepanakert-Nakhichevan' radio relay line, which will transmit television programs from Baku to Nakhichevan' and also to the powerful TV relay station at Shusha.

Construction of a television station in Astrakhan-Bazar (which is connected with Baku by a radio relay line) is planned for 1962-1963. This station will cover a territory 100-160 km in radius, mostly in the southeastern rayons of the Republic.

Construction of the Mingeaur-Nukha-Zakataly radio relay line is contemplated. With the help of the Nukha TV relay station, television transmissions could be viewed by the residents of the northern rayons of our Republic.

It is well-known that the people who live and work in Baku speak different languages. In order to satisfy the demand of the main groups (cate-

gories) of the population, it has been decided to introduce a second television program. The reconstruction of the Baku TV Center is expected to start shortly and we hope that the second program will go into operation this year.

"Not in 1965, as we planned, but by 1963," said Gezalov, "we intend to be in a position to have a definite assurance of efficient reception of one television program. We expect to have a program interchange with many cities in the country by the end of the Seven-Year Plan. Programs from Baku, Moscow, the capitals of the sister Republics, and other large cities of our fatherland could be received at any inhabited point of our Republic."

A MAN BOUGHT A TV SET, Moscow, Radio, No 3, 1961, pages 12-13

Every year the workmen of our country purchase more and more goods of the cultural mode of life, such as television sets. This confirms the continuous rise in the material and cultural level of life of the people. Therefore, it is deplorable that the quality of certain makes of TV sets, as well as the state of the service offered by the television shops, still leave a lot to be desired.

A little more than three years ago, M. Morev, a Moscow resident, purchased a "Rubin" television set. "It was a great joy for my family," he writes Pravda. However, it didn't last long. Either the image on the screen would look like a crooked mirror, or it would fade away, or the sound would disappear. Twenty-five technicians (I counted) 'treated' the set since the day I first bought it. Their invoices cost me 748 rubles and 46 kopecks at the old value of the currency. The television set is still out of order." Such complaints are encountered quite frequently.

In accordance with the request of the editorial offices we acquainted ourselves with the operations of television shops Nos 1, 2, 3, 4, 6 and 9 in Moscow. What are the results of these investigations? Unfortunately -- highly unsatisfactory.

The basic shortcomings of the operations in many TV shops are unsatisfactory quality and excessive delays of repair work. Furthermore, we have discovered facts which prove that certain enterprises of the radio industry do not much care about manufacturing high-quality products.

For example, in Television Shop No 3 over 30% of the sets are being overhauled during the warranty period. It came to the point where overhaul of the sets in the shop, before their sale to the public, became an everyday occurrence. A special expression was even coined -- "pre-sale overhaul"!

This existing situation -- where industrial enterprises allocate special funds for performing warranty overhauls of their products in the television shops -- can hardly be called normal. The result was that the meaning of the good word "guarantee" was distorted completely. Instead of being the plant's guarantee that its products were good and would work without fail for six months, it simply became a ticket for free service in the shop for that period of time.

It is necessary to raise considerably the responsibility of industrial enterprises manufacturing television receivers as well as of the factories

furnishing vacuum elements, devices, and component parts. Actually, it is the television shops that are called upon to solve all the problems resulting from the low quality of the products. Some enterprises even have printed form letters addressed to certain TV shops in the event that the consumers "bother" them. For example, following is a letter of this type from the Aleksandrovskiy Plant:

"To the Director, Television Shop No.....

Copy to Citizen.....

This organization received a letter from citizen .... complaining that during the process of operation it appeared that television set .... is out of order.

In accordance with the warranty service contract, please investigate and satisfy the claim of citizen....." This document is self-explanatory.

Considerable -- if not insurmountable -- difficulties are experienced by a person who attempts to return to the store a poor-quality set, or who tries to exchange it for a good one.

According to the rules outlined in Minister of Trade RSFSR Order No 333 and in Explanatory Note No 0527 of the Deputy Minister of Trade, the exchange of goods may be considered only after the faulty apparatus has twice undergone thorough overhaul and has broken down again. For this purpose it is necessary to obtain a special statement from the TV shop. However, according to the instructions of the former State Radio Trust of the Ministry of Communications USSR, the TV shops are not allowed to make such statements. They simply confirm the number and nature of the repairs performed, which does not necessarily mean that the set can be exchanged. Here is an example: On 26 April 1960, B. A. Groz purchased a "Rubin-102" television set. During the period April through August it was repaired ten times by the workers of Television Shop No 1, both at the shop and at the home of B. A. Groz. He made a legitimate request for the exchange of the set, but despite the fact that he wrote several complaints to various agencies, his appeal remained unanswered. Thus, willingly or unwillingly, trade workers and officials of the Ministry of Communications relieve certain negligent representatives of the industry of responsibility for manufacturing these defective products.

A very unhealthy situation exists with regard to supplying the shops with picture tubes; radio tubes 31LK, 40LK, 43LK2B, 6P13C, 6Ts10P, 1Ts11P; unified line output transformers; electrolytic capacitors (100-150 microfarad/200-300 volt); etc. At Television Shop No 4 we discovered that approximately 3,000 owners of "Zenit" and "Avangard" TV sets have been waiting for months for the 31LK picture tubes, while the waiting list for the 43LK and 40LK picture tubes contains 250 names. The situation is further aggravated by the fact that the radio tubes, semiconductor devices, and component parts being furnished are often of inferior quality. This particularly applies to such tubes as the 6P13C and 1Ts11P, deflecting systems, and line transformers.

We believe that the time is ripe for Gosplan USSR and the sovnarkhozes which operate radio engineering plants, to look closely into the matter in order to deliver the public from the painful experiences which result from

purchasing defective parts. Also, it is necessary to take energetic steps toward the establishment of facilities for rebuilding used picture tubes.

Insufficient standardization of parts further handicaps the repair of television sets. Maximum uniformity of television assemblies and parts is an imperative necessity in this branch of the industry.

All of the television workshops which we visited have well-equipped permanent facilities, and most of them employ qualified personnel. However, the efficiency of service is extremely poor and consequently complaints of the workers against inadequate maintenance, long waiting, etc., are frequent.

In spite of the availability of modern testing instruments they are not always used in Television Shop No 9 and the operation of television sets is determined only by the check charts. Consequently, it is small wonder that the quality of repairs leaves a lot to be desired. Upon inspection of ten sets which were repaired and returned to owners, we found six to have serious defects. For example, television set KVN-49 had something wrong with its sound. The technician who came to repair it could not correct the defect. There was no improvement after an overhaul at the workshop either, and within three days the owner, Savina, was compelled to call the mechanic again.

It is rather inadvisable to have repairs facilities at each television shop in Moscow, Leningrad, Kiev and other large cities where a great number of television sets are in operation. It would seem more practicable to centralize complicated overhauls of television sets in specialized enterprises, leaving the TV shops to act as receiving points. Concentration of complicated repairs in one place would permit application of the latest techniques, segregation of the overhauling by makes of sets, more rational utilization of qualified personnel, and the possibility of raising the standards of workmanship and reducing labor costs.

The weakest part of a television shop is the organization of the line radio-mechanics who do repair work in homes. Cadres of mechanics were selected basically from among people who had a brief period of training within the organization of the former Radio Trust and who obtained practical knowledge in repairing TV sets in the workshops. Later, the shop collectives were replenished by graduates of technical schools. However, there is still a number of workers possessing only a very superficial knowledge of the complicated television equipment, while others are not conscientious in carrying out their responsibilities. Here are some facts. Shop No 3 repaired TV set KVN-49 belonging to I. Nachatov. Several calls -- and several payments -- later the TV set is still in the same sad condition: the image is distorted and has the wrong vertical measurements.

Shop No 3 mechanic B. Kablunovskiy repaired a KVN-49 set belonging to televiewer Volodin three times within one month. When first called he replaced the focusing-deflecting system, but within a short period of time both the sound and the picture disappeared. Another overhaul ensued. A few days later V. Kablunovskiy was called again; this time the owner complained about periodic disappearance of the image.

The wage rate of a radio-mechanic depends on the number of repairs performed by him and on the nature and cost of these repairs. In overfulfilling the norm by 25% the workmen receive a bonus in an amount equal to

one-half of the basic rate (if there are no substantiated complaints from the population).

Everything looks normal on the surface. However, what does actually happen? In order to earn a bonus one must make eight calls a day. Even supposing that all eight customers live comparatively close to one another, one would have no more than 25 minutes for the repair of each set. During this short period of time it is practically impossible to do much more than make only minor corrections in the set. Consequently, if the mechanic encounters more complicated defects he makes every attempt to have the television set sent to the workshop, which results in the overloading of the repair shop (instead of the allotted five days, shop repairs of TV sets take -- as a rule, -- 20-30 days and more).

Mechanics of Television Shop No 3 refuse to attend even to minor repairs in the homes and usually make every attempt to direct the broken television sets to the workshop. This entails additional difficulties (the owner himself must deliver the set to the radio shop) and additional expenses.

However, that is not all. Trying to overfulfill the plan, the dishonest mechanics deceive the public and abuse the confidence of the population by reporting work which, in fact, was not done, receive pay for repeat calls, etc. We have discovered several cases where the simple replacement of tubes was reported as a major, or even a complete overhaul, when work orders were written to cover the job that was not done, etc.

In our opinion the above-mentioned shortcomings are typical of the entire system of the Television Trust, Ministry of Communications RSFSR and -- according to letters published in Pravda and Radio -- are even more prevalent in other republics. The Republic Television Trust is a young organization and it should not be blamed for the omissions of its predecessor, the All-Union Radio Trust. However, it is believed that there is a good reason for the workers of television shops to worry about the tardiness of the Television Trust in solving the problems of strengthening the technical base, improving the supply of materials and equipment, proper employment of labor, fixing the wages, and assurance of the availability in the system of qualified cadres and skilled workers. Obviously, basic improvements in serving the population will depend, first of all, on the above measures.

Investigation Brigade of Pravda and the magazine Radio:

Yu. Gudkov, Chief Technician; M. Rumyantsev and V. Maslovskiy, radio amateurs; Lt Col (Reserve) Z. Layshev; R. Svoren', V. Abramovich, A. Kuz'minov, V. Vasil'eva, B. Levandovskiy, G. Sitnikov, V. Terent'ev and A. Reznikov, engineers; A. Piltakyan and Yu. Tumin, scientific workers; V. Ivanov, L. Troitskiy and A. Graf, senior editors of Radio; V. Goncharov, special correspondent of Pravda.

USSR TELEVISION DEVELOPMENT -- Moscow, Televideniye, No 1 (222), 1 Jan 61

At present, 100 television centers and powerful relay stations are in operation in the USSR. During a one-year period alone, 16 new television centers went into operation. Now, with the opening of the Ashkhabad and Stalinabad television centers, television broadcasting is provided in all-union-republic capitals. Regular television broadcasting has begun in Makhachkala, Groznyy, and Yoshkar-Ola. Three new television centers were built in the Kazakh SSR -- in Aktyubinsk, Petropavlovsk, and Dzhezkazgan. Television centers have gone into operation in a number of Far Eastern cities -- Yuzhno-Sakhalinsk, Khabarovsk, Magadan, and Komsomol'sk-na-Amure. New relay stations were built in Orel, Kursk, Lipetsk, Tambov, Chernigov, and Kokhtla-Yarve.

About 3.5 million television sets are installed in the RSFSR, more than 700,000 are operating in the Ukrainian SSR, and more than 100,000 have been registered in the Uzbek SSR.

In 1961, television broadcasting will be organized in the capitals of four more ASSRs -- Cheboksary (Chuvashskaya ASSR), Saransk (Mordovskaya ASSR), Ordzhonikidze (Severo-Osetinskaya ASSR), and Ulan-Ude (Buryatskaya ASSR). New television centers will start operating in Petropavlovsk-Kamchatskiy, Orenburg, Pskov, and Berezniki (Permskaya Oblast). Standard television centers will replace the presently operating amateur stations in Barnaul and Astrakhan'.

In addition to the relay stations in Orel and Kursk (on the Moscow-Khar'kov interurban line), a station in Belgorod will be added. One more station, in the city of Dubna, will start relaying Moscow programs. The Moscow-Yaroslavl' radio relay line will be extended to Vologda, and the Kemerovo--Leninsk-Kuznetskiy line to Stalinsk. New relay stations will go into operation in Nizhniy Tagil and Kandalaksha.

TALLIN RECEIVING MOSCOW TV -- Moscow, Izvestiya, 1 Jan 61

Today, the Tallin Television Center started for the first time regular reception of television transmissions from Moscow by means of two programs.

PERM'-SVERDLOVSK RADIO RELAY LINE COMPLETED -- Moscow, Izvestiya, 27 Jan 61

Construction work was completed ahead of schedule on the Perm'Sverdlovsk radio relay line.

In 1961, work will be completed on the Perm'-Izhevsk section. In 1962, television viewers in the western Urals will be able to see Moscow programs.

RADIO RELAY LINE IN MOLDAVIAN SSR -- Moscow, Moskovskaya Pravda, 28 Jan 61

Construction has started in the Moldavian SSR of a radio relay line which will go into operation at the start of 1962. Television programs will be exchanged with Kiev, Moscow, Leningrad, and Minsk.

Kiev, Pravda Ukrainy, 1 Feb 1961

The radio relay line on which construction was recently started will connect Kiev with Kishinev. It will be possible to receive television programs from Moscow, Leningrad, and other cities through Kiev.

MOSCOW-ROSTOV-TBILISI-YEREVAN-BAKU RADIO RELAY LINE -- Yerevan, Kommunist, 1 Feb 1961

Work is now under way on the construction of the Moscow-Rostov-Tbilisi-Yerevan-Baku radio relay line. When the line goes into operation in 2 years, the number of television receivers in the Armenian SSR will increase from the more than 30,000 at present to 100,000.

CABLE LINE BETWEEN LENINGRAD AND HELSINKI -- Moscow, Pravda, 4 Feb 1961

On 3 February in Helsinki, N. D. Psurtsev, Minister of Communications USSR, and S. Alho, General Director of the Postal and Telegraph Administration of Finland, signed an agreement on the laying of a cable trunk line between Leningrad and Helsinki.

KURGAN PHOTOTELEGRAPH STATION -- Moscow, Sovetskaya Rossiya, 19 Feb 1961

A phototelegraph station has gone into operation in Kurgan.

CONSTRUCTION WORK ON PRAGUE-MOSCOW COAXIAL CABLE LINE -- Kishinev, Sovetskaya Moldaviya, 21 Feb 1961

Construction is continuing on Czechoslovak territory of the coaxial cable line which will connect Prague with Moscow. This cable will provide for the reception of television transmissions; also, several thousand telephone conversations can be carried over it. In addition, it will be possible to transmit photographs over the line. The operation of repeater stations will, for the most part, be automatic. Construction of the line will be completed during the Czechoslovak Third Five-Year Plan (1961-1965).

The production of coaxial cable is very complicated. It is produced by only a few countries. The cable to connect Prague with Moscow was manufactured in Soviet plants.

FACSIMILE CIRCUITS FROM MOSCOW -- Moscow, Moskovskaya Pravda, 21 Feb 1961

Phototelegrams were recently sent for the first time from the Central Telegraph Office in Moscow to Orel and Kurgan. Moscow now has facsimile communication with over 100 cities, 28 of them in countries of Europe, Asia, and America.

FIRST CROSSBAR TELEPHONE EXCHANGE IN USSR -- Moscow, Pravda, 15 Mar 1961

The first crossbar ATS (automatic telephone exchange), with a capacity of 1,000 numbers has been developed in the Krasnaya Zarya Plant in Lenin-grad. The new ATS operates without any personnel.

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